16550 Serial Ports & Bi-directional Parallel Port

HighSpeed I/O

I/O Professional

User's Manual

SIIG, Inc.

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About this Manual

The purpose of this manual is to introduce you to your I/O Professional adapter board. It will guide you on how to configure and install the board for proper operation in your computer. Please save this manual for future reference in the event you wish to connect other devices to your system.

This manual is comprised of the following sections:

Chapter 1: Introduction
Introduces the I/O Professional and its features.

Chapter 2: Quick Installation
Provides a quick summary of jumper settings for configuring the I/O Professional for proper operation.

Chapter 3: Installation
Provides instructions on how to set the I/O port address and interrupt request for each port on the board, plus installation in your computer.

Chapter 4: Technical Reference
Provides the pin assignments for the serial and parallel port connectors.

Chapter 1
Introduction

1-1 Introducing the I/O Professional

Congratulations on your purchase of the high-speed I/O Professional adapter board. The I/O Professional is a powerful and flexible state-of-the-art I/O expansion board for your ISA-bus-based IBM PC/AT or AT-compatible computer. It provides two high-speed RS232 serial ports (one 9-pin and one 25-pin) and one bi-directional Centronics and PS/2 compatible parallel port for connecting peripheral devices to your computer.

The I/O Professional's design utilizes an on-board 16C552 chip which incorporates the latest in interface technology. It controls the bi-directional parallel port and includes two high-speed 16550 serial port chips. The bi-directional parallel port is a standard printer port, or it can be used to communicate with other devices such as external drives and SCSI drives when a parallel-to-SCSI adapter interface is used. This bi-directional feature is ideal for downloading data from a laptop computer to SCSI drives on PCs. The high-speed capability of the 16550 serial ports also support high-speed modem communication.

1-1.1 Features

- Compatible with IBM PC/AT and AT-compatible computers
- 16550 serial port chip technology for high-speed serial communications
- Two serial ports (one 9-pin and one 25-pin) to support mice, printers, external modems and other serial peripherals

- 16 byte FIFO buffers on both transmit and receive of each channel relieves the CPU of interrupt overhead and allows greater latency time in interrupt service when in a multitasking environment
- One bi-directional Centronics and PS/2 compatible parallel port for direct printer interface
- Bi-directional parallel port supports external drives and SCSI drives using parallel-to-SCSI adapter interface
- All I/O port addresses are jumper selectable

Chapter 2
Quick Installation

This chapter provides a quick summary of jumper settings for configuring the I/O Professional for proper operation in your system. Also refer to *Chapter 3* if you need further information on how to install the board in your system.

2-1 Jumper Configurations

Serial Port 1 (RS232C)

Port Description			Jumper Settings		
Port	Address	IRQ	JP2-1	JP2-2	JP1
* COM1	3F8–3FF	4	Open	Open	A & B
COM3	3E8–3EF	5	Closed	Open	B & C
COM4	2E8–2EF	9	Open	Closed	I & J
Disable		N/A	Closed	Closed	N/A

Serial Port 2 (RS232C)

Port	Address	IRQ	JP2-3	JP2-4	JP1
* COM2	2F8–2FF	3	Open	Open	D & E
COM4	2E8–2EF	9	Closed	Open	J & K
COM3	3E8–3EF	5	Open	Closed	C & D
Disable		N/A	Closed	Closed	N/A

Parallel Printer Port

Port	Address	IRQ	JP2-5	JP2-6	JP1
* LPT*n*	378–37F	7	Closed	Open	F & G
LPT*n*	278–27F	5	Open	Closed	M & N
Disable		N/A	Closed	Closed	N/A

Bi-directional Parallel Port Compatibility

Description	JP2-7
* Bi-directional	Open
Centronics	Closed

*= *Factory Default; N/A = Not Applicable.*

Chapter 3
Installation

This chapter will guide you through the installation of your I/O Professional adapter board. It includes instructions on how to set the I/O port address and interrupt request for each port and installation of the board in your computer.

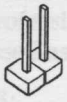
3-1 Configuring the Ports

Prior to installing the I/O Professional board in your computer, verify the jumper switches on the board for proper operation. To do this, you must know the following about your computer:

Are there any serial or parallel ports currently installed in your computer? If so, what I/O port addresses and Interrupts (IRQ) do they use?

After determining your computer's configuration, make sure the port addresses and IRQs set on the I/O Professional are different from any existing ports in your system. A conflict results when two addresses are the same. Refer to the next sections for determining the correct jumper settings for configuring ports on the board.

The I/O port address and interrupt request is jumper selectable for each port. When setting the jumpers, the terms "open" and "closed" are defined as:



Open
(No Jumper Installed)

Closed
(Jumper Installed)

3-1.1 Serial Port 1 (9-Pin RS232)

Serial Port 1 provides a standard DB9 9-pin connector mounted on the board. It is factory set as COM1 with I/O port address 3F8-3FF and IRQ4. If this conflicts with your current configuration, refer to the following table for another option.

Port Description			Jumper Settings		
Port	Address	IRQ	JP2-1	JP2-2	JP1
* COM1	3F8–3FF	4	Open	Open	A & B
COM3	3E8–3EF	5	Closed	Open	B & C
COM4	2E8–2EF	9	Open	Closed	I & J
Disable		N/A	Closed	Closed	N/A

3-1.2 Serial Port 2 (25-Pin RS232)

If you intend to use the secondary Serial Port 2 on the I/O Professional, you must install the second serial port connector included with the board. This port is factory set as COM2 with I/O port address 2F8-2FF and IRQ3. If this conflicts with your current configuration, refer to the following table for another option.

Port Description			Jumper Settings		
Port	Address	IRQ	JP2-3	JP2-4	JP1
* COM2	2F8–2FF	3	Open	Open	D & E
COM4	2E8–2EF	9	Closed	Open	J & K
COM3	3E8–3EF	5	Open	Closed	C & D
Disable		N/A	Closed	Closed	N/A

*= *Factory Default; N/A = Not Applicable.*

3-1.3 Bi-directional Parallel Printer Port

The parallel printer port provides a standard DB25 25-pin connector mounted on the board. It is factory set for I/O port address 378-37F and IRQ7. If this conflicts with your current configuration, refer to the following table for another option.

Port Description		Jumper Settings		
Address	IRQ	JP2-5	JP2-6	JP1
* 378–37F	7	Closed	Open	F & G
278–27F	5	Open	Closed	M & N
Disable	N/A	Closed	Closed	N/A

*= *Factory Default; N/A = Not Applicable.*

Unlike serial ports, which can be specifically set as COM1, COM2, COM3 or COM4, LPT parallel printer ports are determined by the highest I/O port address. The highest address present in the system is always LPT1; the second highest, LPT2; the third, LPT3. The prioritized order for I/O port addresses from high to low is: 3BC, 378 and 278.

The following examples will help you determine how to configure the I/O Professional's parallel printer port.

Example 1:

When 0 parallel ports are already installed in your computer... the parallel port on the I/O Professional will be addressed as **LPT1** when its I/O port address is set to **378.**

Example 2:

When 1 parallel port with address 3BC is already installed... the parallel port on the I/O Professional will be addressed as **LPT2** when its I/O port address is set to **378.** In this case, set the I/O Professional to IRQ 5. (The original parallel port will be addressed as LPT1.)

Example 3:

When 1 parallel port with address 378 is already installed... the parallel port on the I/O Professional will be addressed as **LPT2** when its I/O port address is set to **278.** In this case, set the I/O Professional to IRQ 5. (The original parallel port will be address as LPT1.)

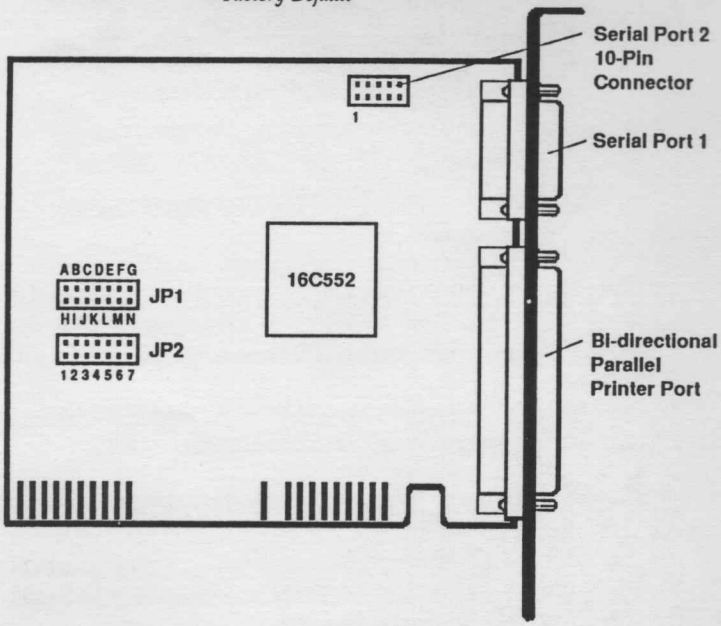
Example 4:
When 1 parallel port with address 278 is already installed... the parallel port on the I/O Professional will be addressed as **LPT1** when its I/O port address set to **378**.
(The original parallel port will be address as LPT2.)

3-1.4 Bi-directional Parallel Printer Port Compatibility

The parallel printer port provides a bi-directional Centronics and PS/2 compatible parallel port for direct printer interface. Jumper JP3-7 must be set for the type of computer the I/O Professional is installed in. The factory default setting is for Bi-directional.

Description	JP2-7
* Bi-directional	Open
Centronics	Closed

*= *Factory Default*



I/O Professional Board Layout

3-2 Installing the I/O Professional Board

After you have configured the I/O Professional board, proceed with the following instructions to install it in your computer. General instructions for installing the board are given since the design of computer cases varies. Refer to your computer's reference manual whenever in doubt.

1. Turn OFF the power to your computer and any other connected peripheral devices. Follow the precautions for static electricity discharge.

   WARNING: STATIC ELECTRICITY DISCHARGE may permanently damage your system. In order to avoid possible static electricity discharge during installation procedures, please follow the guidelines below:

   - *Discharge any static electricity build up in your body by touching a large grounded metal surface such as the computer case if plugged in, a metal window frame, refrigerator, or water tap for a few seconds.*
   - *During installation procedures, avoid any contact with internal parts. Handle cards only by their edges.*

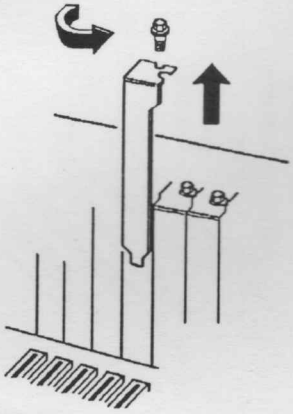
   WARNING: Disconnect the AC power source before removing the cover.

2. Unplug all power cords and cables from the back of the computer. (Be sure to note the cable connections for reconnection when the installation is complete.)

3. Remove your computer's cover by removing its mounting screws with a screwdriver. Slide the cover OFF.

4. Your I/O Professional board can be installed in any available 8-bit expansion slot. However, if you intend to use the secondary Serial Port 2, select an I/O expansion slot with an adjacent slot available for installing the Serial Port 2 25-pin connector bracket.

5. Remove the board's selected slot cover by unscrewing the holding screw and sliding it out. Save this screw for securing the I/O Professional board after it's installed. Follow the same procedure for the Serial Port 2 mounting bracket.



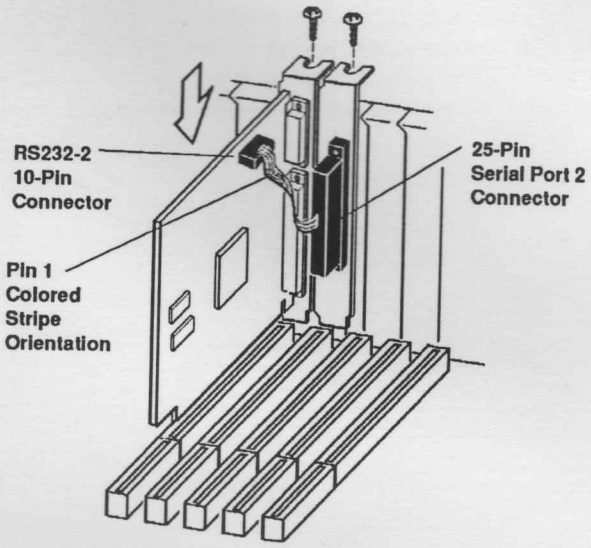
Remove the Slot Cover

6. To install the I/O Professional board, carefully align the board's bus connector with the selected bus connector slot on the motherboard. Push the board down firmly, but gently, until it is well seated.

   NOTE: Hold the board by its external edges only. Try to avoid touching the components, connectors or pins.

7. Replace the cover slot holding screw to secure the board to the rear slot panel.

8. To install the Serial Port 2 bracket, carefully slide it into the selected rear panel slot where the slot cover had been removed. Replace the cover slot holding screw to secure the connector bracket in place.



Installing the I/O Professional and Serial Port 2

9. If you installed the Serial Port 2 connector bracket, connect the 10-pin connector on the end of the ribbon cable to the I/O Professional board's RS232-2 10-pin connector. The colored stripe on the ribbon cable indicates the pin 1 side of the connector. Make sure this is matched with pin 1 on the board's connector.

10. Replace the computer's cover and screws.

11. Reconnect all power cords and cables to the back of the computer and make any new connections to the I/O Professional board ports.

You have completed the installation. Most computers will display a system configuration table, including port addresses when it is powered ON or rebooted. Turn your computer ON and verify that the I/O port addresses are set properly.

Chapter 4
Technical Reference

This chapter provides the pin assignments for the serial and parallel port connectors on the I/O Professional adapter board.

4-1 Connector Pin Assignments

4-1.1 Bi-directional Parallel Printer Port

Pin assignments for Parallel Port DB25 connector.

Pin No. (Computer)	Function	Pin No. (Printer)
1	-STROBE	1
2	D0	2
3	D1	3
4	D2	4
5	D3	5
6	D4	6
7	D5	7
8	D6	8
9	D7	9
10	-ACK 1	10
11	BUSY	11
12	PE	12
13	SLCT	13
14	-AUTOFD	14
15	-ERROR	32
16	-INIT	31
17	SLCT IN	36
18-25	GRD	16, 19-30, 33

4-1.2 Serial Port 1

Pin assignments for Serial Port 1 DB9 connector.

Pin	Function
1	Data Carrier Detect
2	Receive Data
3	Transmit Data
4	Data Transmit Ready
5	Ground
6	Data Set Ready
7	Request to Send
8	Clear to Send
9	Ring Indicator

4-1.3 Serial Port 2

Pin assignments for Serial Port 2 DB25 connector.

Pin	Function
1	Frame Ground
2	Transmit Data
3	Receive Data
4	Request to Send
5	Clear to Send
6	Data Set Ready
7	Signal Ground
8	Data Carrier Detect
9	+DC test voltage
10	–DC test voltage
11	Equalizer Mode
12	2nd Data Carrier Detect
13	2nd Clear to Send
14	2nd Transmitted Data
15	Transmitter Clock
16	2nd Received Data
17	Receiver Clock
18	Not Used
19	2nd Request to Send
20	Data Terminal Ready
21	Signal Quality Detect
22	Ring Indicator
23	Data Rate Selector
24	External Transmitter Clk
25	Not Used